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मानक

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“पुराने को छोड़ नये के तरफ”

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IS 11854 (1986): Crampons Mountaineering Non-Adjustable
[PGD 27: Mountaineering Equipment]



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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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**AMENDMENT NO. 1 MARCH 1992
TO
IS 11854 : 1986 SPECIFICATION FOR CRAMPONS
MOUNTAINEERING NON-ADJUSTABLE**

(Page 1, clause 4.1) — Substitute 'Si' for 'S' and Si = 0.015% Max.

(Page 1, clause 5.1, second sentence) — Substitute the following for the existing:

"The hardness of the crampons at the tip of the spikes shall be between 350 to 400 HV."

(LMD 07)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR
CRAMPONS MOUNTAINEERING
NON-ADJUSTABLE

1. Scope — Covers the requirements for non-adjustable crampons for mountaineering.

2. Nomenclature — Shall be as given in Fig. 1.

3. Dimensions — Dimensions shall be as given in Table 1 read with Fig. 1.

3.1 The normal engineering tolerances shall apply to the dimensions given in Table 1.

4. Material

4.1 Crampons — Shall be manufactured from steel sheet having the following chemical composition and mechanical properties:

Chemical Composition

C	0.1	—	0.4%
S	0.1	—	0.35%
Mn	0.2	—	0.7%
Ni	2.7	—	3.3%
Cr	0.5	—	1.0%
Mo	0.4	—	0.7%
V	0.25		Max
P	0.015		

Mechanical Properties

Tensile strength	710 N/mm ² , Min
Yield strength	360 N/mm ² , Min
Elongation	18 percent, Min

4.1.1 The physical property of manufacturing metals shall be such as to satisfy its performance at temperatures of +20° to -50°C encountered in mountaineering.

4.2 Rings — Mild steel wire to condition $\frac{1}{2}$ hard of IS : 280-1978 'Mild steel wire for general engineering purposes (third revision)'.

5. Heat Treatment and Hardness

5.1 The entire structure shall be suitably hardened specially at the centre and spikes with sufficient tensile strength to enable making proper bend for the spikes, adjustable arm and hooks. The hardness of body of crampons (sole and heel) shall be between 350 to 400 HV. The crampons after hardening shall be tempered to relieve stresses and formation of cracks.

6. General Requirements

6.1 Design — The design of non-adjustable crampon shall be suitable for excellent performance during descending and ascending over steep slopes of hard snow and ice. The crampon shall consist of two component parts 'sole' and heel. The two halves are linked together by an arm which allow them to be folded over completely when not in use.

6.1.1 Sole half — Shall consist of four spikes two front point and two hooks with rings.

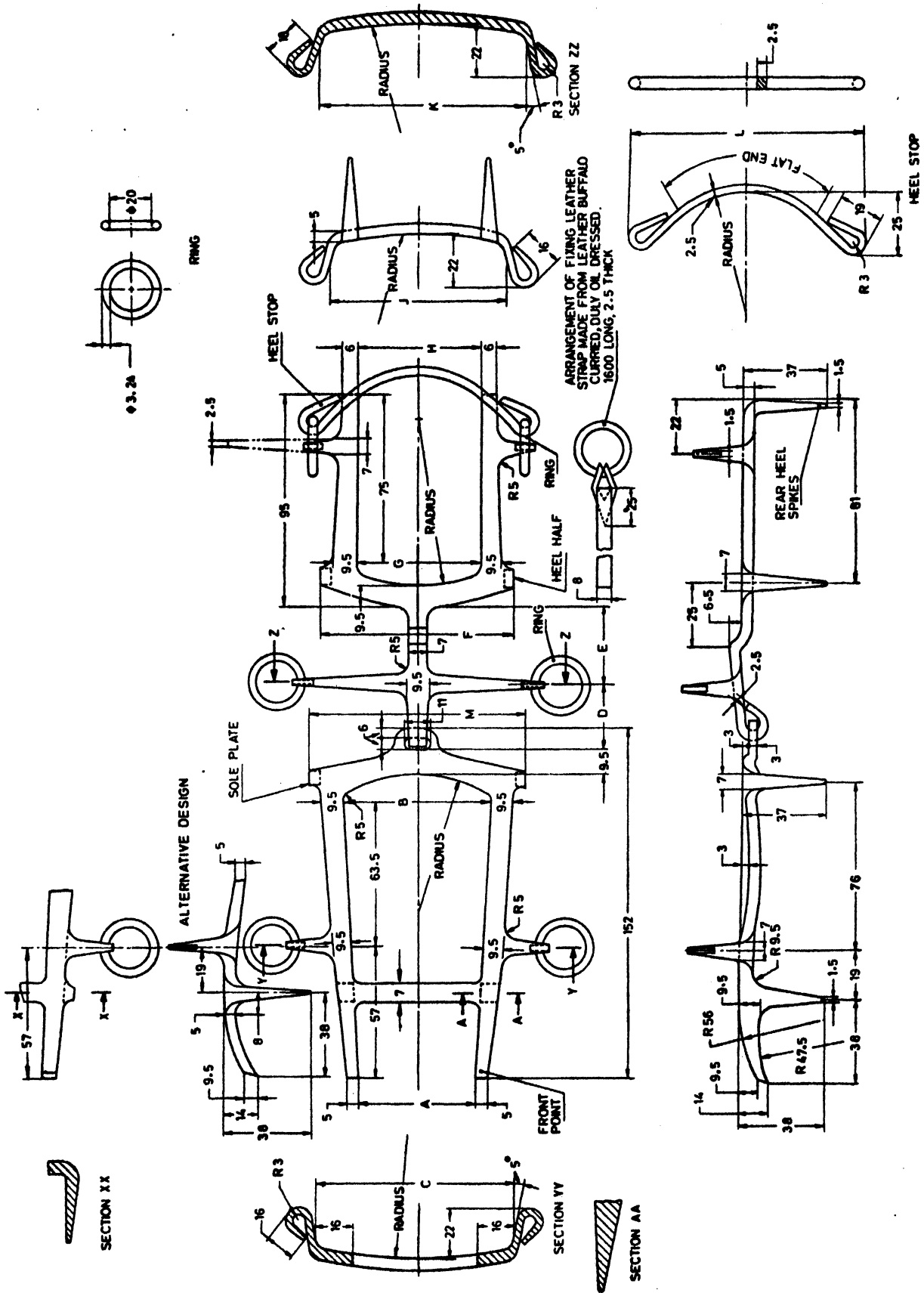
6.1.2 Heel half — Shall consist of four spikes, four hooks with rings.

6.1.3 Heel stop — Shall be provided at the back of the heel half to secure heel.

Adopted 7 October 1986

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All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR CRAMPONS, NON-ADJUSTABLE

TABLE 1 DIMENSIONS FOR CRAMPONS, NON ADJUSTABLE
(Clause 3 and Fig. 1)

All dimensions in millimetres.

Size	A	B	C	D	E	F	G	H	J	K	L	M
5	47.5	64	89	32	28.5	81	52	51	89	87	90	95
6	47.5	64	92	35	32	81	52	54	89	89	90	95
7	47.5	67	95	41	35	82	53	57	91	90	91	95
8	57	70	98	47.5	41	86	54	49	91	91	94	95
9	57	73	100	47.5	41	86	56	60	98	95	95	95
10	57	73	102	51	47.5	87	57	60	98	97	95	95
11	57	76	105	60	54	19	59	62	100	98	95	105
12	59	79	108	67	57	92	60	64	102	100	102	108
13	62	82	111	70	60	95	64	65	105	103	106	111

6.1.4 Spikes — For all types of crampons for general use, the spikes shall be not less than 32 mm long as they shall need to bite through loose snow or ice chippings lying on ice slopes. However, where there is great deal of iced rock, shorter points are preferable. Edges of the spikes shall be of 'V' shape to facilitate penetration in ice. To protect the sack and its contents, there shall be rubber tubing on the spikes.

6.1.5 Hooks — All hooks shall be of about 22 mm measured vertically from the surface of the sole to the top of hook. Two hooks in the back at heel shall be perpendicular at top but slightly curved at the base of hook so as to afford tight grip and fitting to the boot. Top of hook shall be bent outwards into a loop for linking of rings.

6.1.6 Rings — Provision shall be made to ensure their hanging outside the crampons before the boot is placed in it. The rings shall ensure quick manipulation of bindings to save time and energy.

6.1.7 Bindings — It is essential for a climber to be able to put on and take off crampons speedily on the mountain. Because of the importance of speed, quick release bindings are normally used. They shall be made of nylon strap of minimum breaking strength of 2 kN and 12 mm width with round smooth end for better fastening of straps or leather buffalo curried.

6.1.7.1 There shall be a single nylon or leather strap usually about 1.6 m long and one end shall be provided with a buckle in the ring at the outside of heel. This shall not only facilitate in tightening the boot equally on the crampon but make fittings of the boot in the crampon even.

6.1.8 Fitting crampons shall be made of the same size as the boot but it shall be so tempered that they fit perfectly and do not require cold hammering while fitting for minor adjustment. The test of a correct fit is that the boot shall be picked up and lightly shaken. The unstrapped crampon shall not drop off.

6.1.9 Rubber tube — For carrying crampons, rubber tubing is put on the spikes.

7. Designation

7.1 A non-adjustable crampon of nominal size 5 shall be designated as:

Crampon Non-adjustable 5 IS : 11854

8. Workmanship and Finish — The crampons and its components shall be free from any, even hair cracks, pits, burrs, sharp edges, other formation likely to damage vibran sole and other forging of manufacturing defects. Crampons shall be resistant to corrosion in use and storage.

8.1 The crampons shall be nickel-chrome plated to service grade No. 2 of IS : 1068-1985 'Electroplated coatings of nickel plus chromium and copper plus nickel plus chromium on iron and steel (*second revision*)' or cadmium plated to service condition No. 2 of IS : 1572-1968 'Electroplated coatings of cadmium on iron and steel (*first revision*)'.

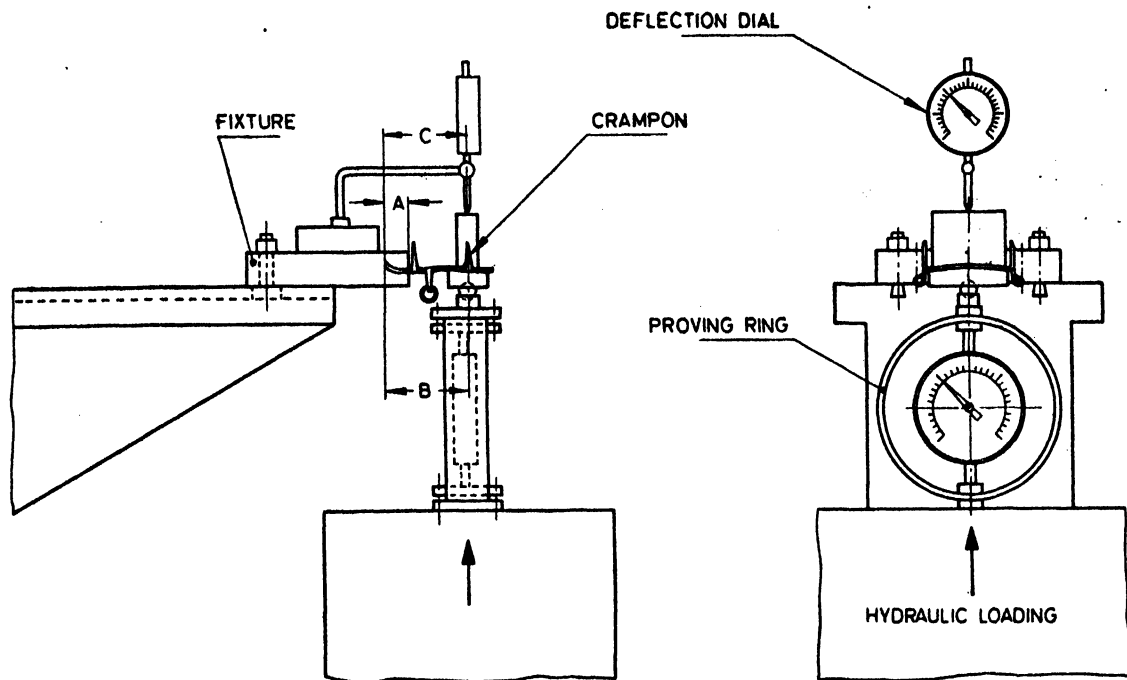
9. Tests

9.1 Low Temperature Test — Each crampon shall be conditioned at -30°C for 2 hours. The crampon after conditioning shall be removed from the chamber and immediately tested for impact energy of 120 Nm. A flat weight of 200 N covering the entire area of crampon shall be dropped squarely from a height of 600 mm. The crampon shall not show any deformity or cracks on examination.

9.2 Tests for Front Point and Rear Heel Spikes

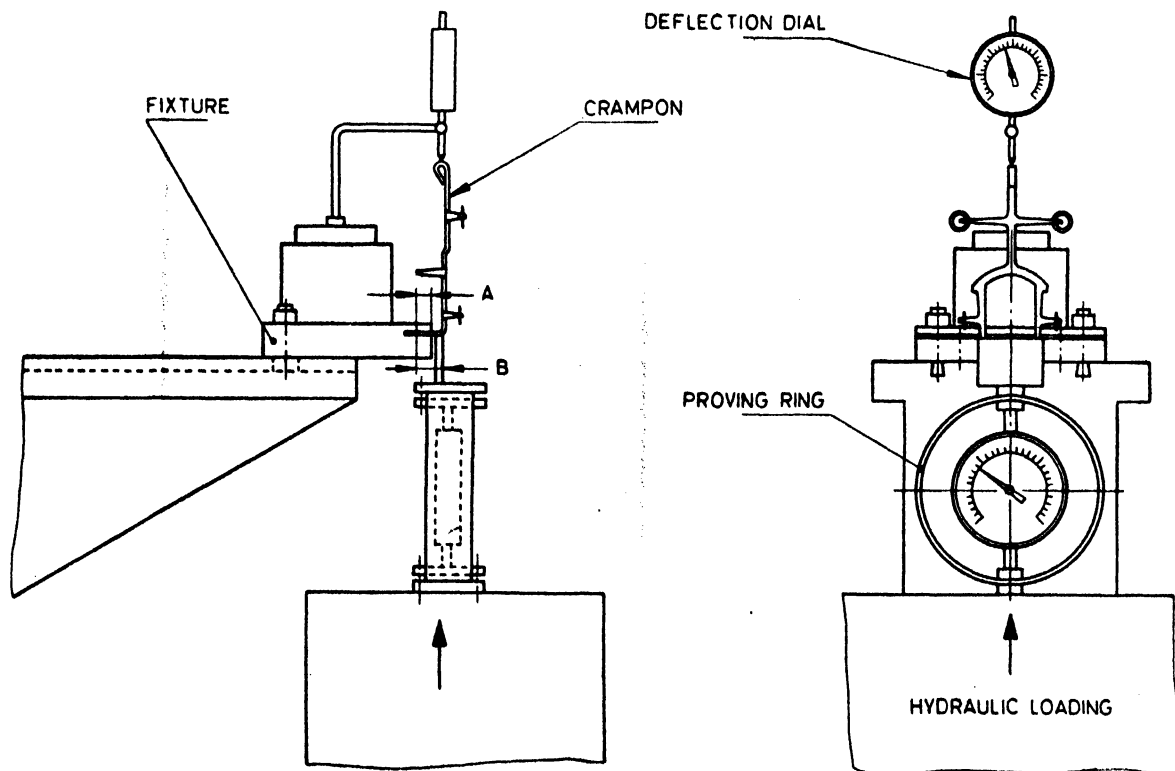
9.2.1 Front point — The front point of the crampons when gripped in clamps to a length of 28 mm from the front tip of the point and subjected to a transverse (bending) load of 165 kg at 103 mm from the tip shall not show any sign of failure. The deflection at 103 mm from the tip shall not be more than 15 mm. The permanent deflection at the same point after release of load shall not be more than 5 mm (*see Fig. 2*).

9.2.2 Rear heel spikes — The rear heel spikes when gripped to a length of 20 mm from the tip of the point in a clamp and subjected to a transverse load of 1300 kg at a distance 30 mm from the tip of the rear teeth shall not show any sign of failure. The maximum deflection permissible during loading is approximately 2 mm at the point of loading (*see Fig. 3*).



Point of clamping $A = 28 \text{ mm}$
 Point of loading $B = 103 \text{ mm}$
 Point of deflection $C = 103 \text{ mm}$

FIG. 2 TESTING OF CRAMPON (FRONT POINT)



Distance of rear teeth to point of clamping $A = 20 \text{ mm}$
 Distance of rear teeth to point of loading $B = 30 \text{ mm}$

FIG. 3 TESTING OF CRAMPON REAR (HEEL SPIKE)

10. Marking — Each crampon shall be legibly and indelibly stamped/marked with the manufacturer's name, initials or recognized trade mark, the year of manufacturing and the size of the crampon.

10.1 Certification Marking — Details available with the Bureau of Indian Standards.

EXPLANATORY NOTE

Crampons are sets of spikes which are strapped underneath the climbing boots. They provide firm grip on hard snow and ice and enable steep slopes to be climbed.

This standard on crampon, non-adjustable has been prepared keeping in view the various requirements of crampons for mountain climbing such as, to enable the climber to move much more quickly and effortlessly with greater degree of safety in hard snow and ice and on slopes, descending and ascending on steep slopes of ice, vertical climbing on ice faces and to produce crampons indigenously for the use of mountaineers.

The requirements of adjustable crampon are covered in IS. 9802-1981 'Adjustable crampons for mountaineering'.